CLAIMS

1. A deposit sensing apparatus employing differential heat flux measurement across a heat transfer surface, said apparatus comprising:
   (a) a mounting unit with a heat transfer path;
   (b) at least two hollow vessels;
   (c) at least two heat flux sensors;
   (d) a heater element;
   (e) one of said vessels and one of said sensors being conductively mounted onto a first surface of said mounting unit, said one of said sensors positioned between said one of said vessels and said first surface;
   (f) another one of said vessels and another one of said sensors being conductively mounted onto a second surface of said mounting unit, said another one of said sensors positioned between said another one of said vessels and said second surface;
   (g) said first surface and said second surface being conductively associated with said heat transfer path;
   (h) said heater element being effective to provide a constant heat flux to said heat transfer path.
2. The apparatus of claim 1 wherein said apparatus is insulated with insulating material to enhance heat transfer efficiency.
3. A method for the measurement of differential heat flux, said method comprising the steps of:
   (a) providing a heat transfer reference surface;
   (b) providing a heat transfer fouling surface;
   (c) providing a heat transfer path capable of transferring heat flux between said reference surface and said fouling surface;
   (d) measuring differential heat flux data across said heat transfer path;
   (e) utilizing said differential heat flux data to detect and quantify deposit accumulation at said fouling surface.

4. The method of claim 3 wherein said differential heat flux data is calculated according to the formula $\Delta Q_t = Q_r - C \cdot Q_f$.
5. The method of claim 3 wherein said reference surface is provided by mechanical brushing.
6. The method of claim 4 wherein said reference surface is provided by mechanical brushing.
7. The method of claim 3 wherein said reference surface is provided by sonic waves.
8. The method of claim 4 wherein said reference surface is provided by sonic waves.
9. The method of claim 3 wherein said reference surface is provided by an electronic device capable of maintaining a constant reference heat flux on said reference surface.
10. The method of claim 4 wherein said reference surface is provided by an electronic device capable of maintaining a constant reference heat flux on said reference surface.
11. The method of claim 3 wherein said reference surface is provided by a non-fouling fluid.
12. The method of claim 11 wherein said non-fouling fluid is deionized water.
13. The method of claim 11 wherein said non-fouling fluid is synthetic cooling fluid.
14. The method of claim 11 wherein said non-fouling fluid is a combination of fluid exiting from the fouling tube and antifouling chemicals.
15. The method of claim 4 wherein said reference surface is provided by a non-fouling fluid.
16. The method of claim 15 wherein said non-fouling fluid is deionized water.
17. The method of claim 15 wherein said non-fouling fluid is synthetic cooling fluid.

18. The method of claim 15 wherein said non-fouling fluid is a combination of fluid exiting from the fouling tube and antifouling chemicals.

19. The method of claim 3 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

20. The method of claim 4 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

21. The method of claim 5 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

22. The method of claim 6 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

23. The method of claim 7 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

24. The method of claim 8 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

25. The method of claim 9 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

26. The method of claim 10 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

27. The method of claim 11 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

28. The method of claim 12 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

29. The method of claim 13 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

30. The method of claim 14 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

31. The method of claim 15 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

32. The method of claim 16 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

33. The method of claim 17 further comprising the steps of:
(a) generating a signal indicative of said heat flux data;

(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

34. The method of claim 18 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;

(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.